

UNITED STATES PATENT OFFICE

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BLACK POWDER

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United States, as represented by the Secretary
of War

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The invention described herein may be manu-
factured and used by or for the Government for
governmental purposes, without the payment to
us of any royalty thereon.

This invention relates to black powder.

In the manufacture of fuzes for projectiles
and fuzes used in blasting operations it is de-
sirable to use black powder having fixed slow
rates of burning appropriate to the particular
purpose of the design. Black powder made ac-
cording to the usual procedure and containing
15% of charcoal made from wood usually has
a higher burning rate than is desirable, and
various methods have been used to overcome
this. Among these may be mentioned increas-
ing the proportion of sulphur in the composition,
the addition of an oil, the use of coal instead
of charcoal, and the addition of a more or less inert
solid such as rosin or talc. Each of these meth-
ods is, however, open to serious objection from
the viewpoint of either manufacture or func-
tioning.

We have discovered that if the charcoal used
in black powder is replaced wholly or in part
with the non-cellular carbon of high purity pre-
pared by the decomposition of sugar, the black
powder burns much more slowly than that con-
taining wood charcoal only. Illustrative of this
are the following burning tests of black powders
loaded in a standard fuze and fired at full set-
ting:

Composition of black powder				Burning time, secs.
Potassium nitrate, per cent	Sulphur, per cent	Wood char- coal, per cent	Sugar car- bon, per cent	
74.0	10.4	15.6		29.2
74.0	10.4	9.36	6.24	35.3
74.0	10.4	5.2	10.4	47.6
74.0	10.4	3.12	12.48	66.0
74.0	10.4		15.6	96.4

From these data it is evident that the burn-
ing rate of black powder can be varied over an
extremely wide range, without affecting its ulti-
mate composition, by substituting carbon pre-
pared from sugar for part or all of the wood
charcoal used ordinarily. Since sugar carbon is
non-cellular, its use decreases the necessity for
the complete and lengthy incorporation usually
required when wood charcoal alone is used. An-
other advantage of the use of sugar carbon is
the fact that commercial sugar is a pure chemi-

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cal compound and the carbon of high purity
can be prepared from it with ease; whereas char-
coal is difficult to control with respect to com-
position and so tends to give black powders of
variable burning characteristics.

We claim:

1. A slow-burning black powder composition
for a time train comprising potassium nitrate
74%, sulphur 10.4%, and wood charcoal and
sugar carbon 15.6%.

2. A slow-burning black powder composition
for a time train comprising potassium nitrate
74%, sulphur 10.4%, and sugar carbon 15.6%.

3. A slow-burning black powder composition
for a time train comprising potassium nitrate,
sulphur, wood charcoal and carbon prepared
from sugar.

4. A slow-burning black powder composition
for a time train comprising potassium nitrate,
sulphur and carbon prepared from sugar.

5. Black powder having its carbon content at
least partly consisting of carbon prepared from
sugar.

6. A black powder comprising an alkali metal
nitrate, sulphur and carbon prepared from sugar.

7. A time train consisting of a black powder
composition comprising an alkali metal nitrate,
sulphur, wood charcoal and carbon prepared
from sugar.

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file of this patent:

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